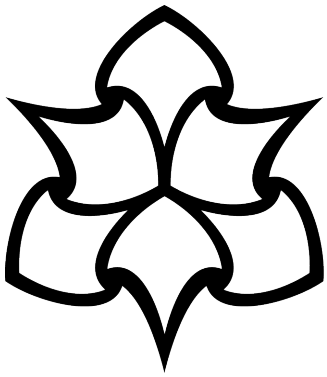

Journal of Public Health: From Theory to Practice (2019) 27:367–378
https://doi.org/10.1007/s10389-018-0948-y

ORIGINAL ARTICLE

Validation of behavioral simulations: a case study on enhancing collaboration between partnership organizations

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Received: 12 March 2018 / Accepted: 14 June 2018 / Published online: 30 June 2018

Abstract

Aim The current article provides a detailed account of a behavioral simulation called Lateral Play. Lateral Play aimed to enhance collaborations and optimize shared decision-making across organizations within a newly formed partnership. The current article aims to enhance appreciation of the behavioral simulation methodology and encourage its use.

Subjects and Methods Health service leaders from different organizations within a newly formed partnership gathered in the simulated community and took up roles similar to their real-life positions. The simulation presented participants with problems and opportunities similar to those that they would experience in real life, such as the need to consolidate services and create new care pathways. To evaluate Lateral Play's effectiveness, self-reported and observational data were collected. These data include information about participants' reactions, learning and behavior, and the newly formed partnership's organizational results.

Results Lateral Play allowed health leaders to better understand how they could enhance collaborations and optimize shared decision-making across their newly formed partnership. The data suggest that simulations can promote effective collaborations.

Conclusions Use of behavioral simulations should be encouraged to promote policy awareness and understanding, refine implementation strategies and improve outcomes in newly formed partnerships.

Keywords Behavioral simulation · Medical decision-making · Cooperation · Psychology · Health policy

The current article provides a detailed account of a large-scale behavioral simulation called "Lateral Play." Lateral Play aimed to enhance collaboration and shared decision-making across organizations within a newly formed healthcare partnership in the UK, called "Imperial College Health Partners" (ICHP; Darzi et al. 2013). In Lateral Play, participants took up roles similar to their senior-level positions in real life, e.g., chief executives, medical directors and finance bosses from different healthcare organizations. The simulation presented participants with problems and opportunities similar to those

Electronic supplementary material The online version of this article (https://doi.org/10.1007/s10389-018-0948-y) contains supplementary material, which is available to authorized users.

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that they would experience in real life, such as the need to consolidate services and create new care pathways. The current article's detailing of Lateral Play is important because while many healthcare leaders already value smaller-scale simulations, the use of larger-scale simulations is generally unexplored (Cohen et al. 2013).

Background

Behavioral simulations

Behavioral simulations can simulate real life by presenting players with relevant information, choice options and realistic choice consequences. In so doing, behavioral simulations can encourage double-loop learning (Argyris and Schön 1978). In the first loop, players learn about the existing system structures, what choice options they have and what choice options produce the most desirable consequences. When the relevant information, choice options and consequences are well known, single-loop learning may be sufficient to produce positive consequences in real life. For example, smaller-scale simulations that encourage single-loop learning are widely used to train medical students to preform laparoscopic surgery (Curet 2007). Such simulations are typically 'smaller' in the sense that they involve one player from one organization solving a narrower range of problems.

When the relevant information, choice options and consequences are not well known, single-loop learning may be insufficient to produce positive consequences in real life. In these cases players need to question what information and choice options they have/need (and whether those should change) and what the consequences of their choices may be. This process results in double-loop learning as players build new mental models that can produce positive consequences in real life (Ellington 2000; Geurts et al. 2007; Harvey et al. 2009; McShane et al. 2011).

Lateral Play aimed to produce double-loop learning. Lateral Play is a larger-scale simulation in the sense that it involved multiple players from multiple organizations solving a broader range of problems. In the current article, the double-loop learning that occurred is evidenced by participants' self-reported data and researchers' observational data.

Evaluating behavioral simulations

Showing that large-scale behavioral simulations are effective is important to encourage their academic and applied use. Unfortunately, behavioral simulations are often not described in sufficient detail to be validated or replicated (for exceptions see Heyne et al. 1994 or Joldersma 1998). Behavioral simulations can be evaluated via self-report or observation, at four levels, including participants' reactions, learning and behavior along with the organization's results (Kirkpatrick and Kirkpatrick 2006). The reaction level focuses on participants' satisfaction with the simulation's organization, content and implementation (Haller et al. 2008). The learning level examines whether participants' attitudes, knowledge and/or skills change. The behavior level examines whether participants' likely or actual behaviors change. The results level examines whether the organization's performance measures change. The current project attempted to capture participants' behavior change using a theoretically informed and empirically validated tool, called the "Behaviour Change Wheel" (Michie et al. 2011).

Why use lateral play

When ICHP was developed, two significant changes occurred affecting the National Health Service (NHS) that could be met with a behavioral simulation. The first change was the Health and Social Care Act 2012, which altered the NHS's structure. This change rendered providers and commissioners uncertain about their job positions. Clarification about how their job positions fit within the new NHS structure was necessary to facilitate collaborations between partners. ICHP's board believed a behavioral simulation was well suited to clarify what people's job positions were, i.e., single-loop learning, and what their positions should be to facilitate collaborations, i.e., double-loop learning.

The second change was that the regional Academic Health Science Networks were created (AHSNs; Liddell et al. 2011; NHS 2013). As AHSN membership was financially incentivized, ICHP wanted to gain AHSN status. To gain AHSN status, ICHP developed seven interim goals to attain membership, where each goal was aligned with one of the AHSN's objectives (Department of Health 2012): (1) improve research participation, (2) translate research into practice, (3) achieve service improvement, (4) collaborate on education and training, (5) use information more efficiently, (6) foster wealth creation and (7) achieve wider population health benefits. As many of ICHP's partner organizations had never worked together, ICHP's board believed a behavioral simulation would be a safe place (i.e., free from real-world consequences) to trial ideas through which they could achieve each aim.

Lateral Play's design

The Centre for Health Policy at Imperial College London designed Lateral Play. First, the structural features of Lateral Play are described, including its layout (The Greendale Partnership), the issues presented (Groups) and the parts people played (Roles). Then, the schedule of events within Lateral Play is described.

The Greendale partnership

The Greendale Partnership was created to simulate ICHP. Like ICHP, The Greendale Partnership brought together health and academic organizations located in an area similar to North West London, where ICHP was based. The physical layout of Greendale appears in Fig. 1. The collaborating health organizations included seven provider NHS Trusts, further described in Appendix 1 Table 4 (and represented as A–G, in Fig. 1), two Clinical Commissioning Groups (CCGs) and a regulatory agency called "Clinical and Organisational Research and Education" (CORE). Other key players outside the partnership in adjacent areas were Provident (a private hospital) and Howston (an NHS Trust; P and H in Fig. 1).

To reflect the diversity of North West London in the United Kingdom, each simulated healthcare provider was based on a real-life healthcare provider. Information about each provider was adapted from the hospital episodes statistics, patient-reported outcome measures, Dr. Foster's guides and providers' websites. In addition, each simulated healthcare provider was given overall ratings for research, care quality, public transport, ambulance times, financial status and training numbers. Basic information about all healthcare providers was given to all participants; see Appendix 1 Table 4. More detailed information about each healthcare provider was available to participants within their assigned healthcare provider group to share at their discretion; see Supplementary Materials 1.

Each healthcare provider was represented by a Chief Executive, a Medical Lead and a Chief Operating/Financial Officer. Each CCG organization was represented by a Chair and a general practitioner (GP). The CORE organization was represented by the Dean of the Medical School, The Chief Executive of Greendale Local Education and Training Board and a representative from the local Collaborations for Leadership in Applied Health Research and Care program (CLAHRC). The Greendale Partnership board, which comprised all CEOs and CCG Chairs, had its own Chair and a Managing Director.

During the simulation, the seating arrangement represented the structure of Greendale; see Fig. 2. Each organization had its

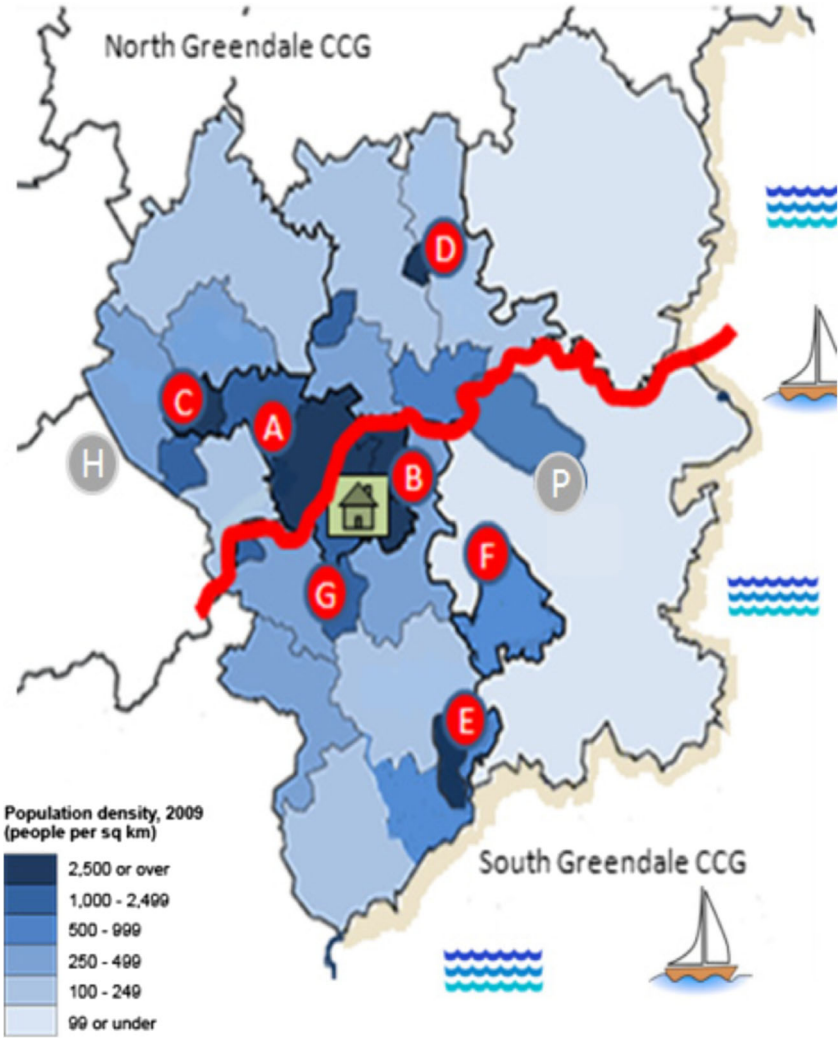

Fig. 1 The simulation patch—Greendale

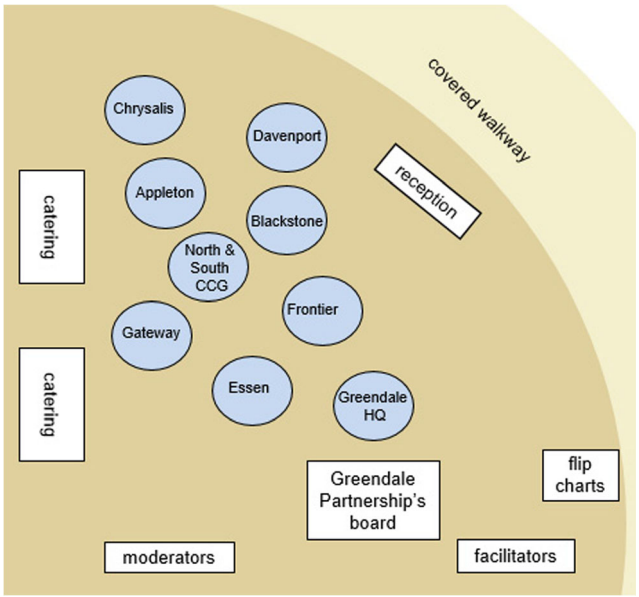

Fig. 2 Layout of Mappin Pavilion for Session 2 of Lateral Play (not to scale)

own table. Participants were free to meet anywhere in the room, except for at the moderator and facilitator tables. While any group meeting could be observed by participants outside that group, meeting participants could raise privacy signs to prevent interruption.

Groups

Participants were allocated into one of five groups. Each group was asked to consider a different real-life issue that ICHP would likely face. These groups are described below.

Group 1: Orthopedic services In the simulation the Greendale Partnership board accepted a proposal to ration orthopedic services across three sites rather than the current five. Group 1's participants were told that Appleton and Blackstone should retain their services and that they needed to decide which two trusts should be asked to transfer their services to the other sites, from Chrysalis, Davenport and Essen. Participants were told to speak with existing units and consider existing service quality, patient accessibility, financial consequences, training opportunities and research contributions. Participants were also told to seek agreements from the CCGs, the Medical School and CLARHC on their decisions.

Group 2: Maternity services In the simulation a CCG expressed an interest in commissioning a midwifery-led unit and was actively working with consultants at Appleton, Davenport and private sector organizations. Group 2's participants were asked to create a proposal to redesign maternity services in line with the CCG's specifications. They were told that their proposal should take into account financial pressures, patient experience and clinical quality. Participants were also told to seek agreements from the CCGs, the Medical School and CLARHC on their decisions.

Group 3: Virtual ward In the simulation Mountain Health, a healthcare provider from the USA, put forth a request to collaborate with Greendale Partnership on a virtual wards pilot. This pilot could bring commercial and research benefits to Greendale. Group 3's participants were asked to develop a response to Mountain Health's request. Participants were told that their response should formulate a business case for the Greendale Partnership board to consider. The business case should lay out what it would mean to develop virtual wards in Greendale, the impact of doing so on real ward capacity/closures and which organization should lead the pilot. Participants were also told to seek agreements from the CCGs, the Medical School and CLAHRC on their decisions.

Group 4: Accountable care model In the simulation the Department of Health offered funding to the Greendale Partnership to develop an "accountable care organization" service delivery model. Group 4's participants were asked to develop this model. They were told that the model should financially integrate primary and secondary elderly care and set out a contractual framework for participating providers, i.e., the formula for financial benefits and risks. The participants were asked to consider the target population, patient choice, appropriate outcome measures, the role of social care and the accountability of participating partners. Participants were also told to seek agreements from the CCGs on their decisions.

Group 5: Community and mental health services In the simulation South Greendale contained two community trust services called Frontier and Gateway. Group 5's participants were asked to develop a plan to foster collaborations and innovations between those two trusts. Frontier was a large trust unable to become a Foundation Trust because of its deficit budget and limited growth. Gateway was the only Mental Health Trust in the area and was in sound financial shape to become a Foundation Trust. Unfortunately, Gateway's budget would be negatively affected by the CCGs new integrated tariff arrangements.

Roles

Participants Twenty-eight participants attended the main simulation event (see Supplementary Materials 2). Representing ICHP's secondary and community care partner organizations were seven Chief Executives, two Directors of Strategy, six Clinical/Medical Directors, three Clinical/Medical Leads, one Chairperson and one Chief Financial Officer. Representing ICHP's primary care partner organizations were two CCG/PCT Chairpersons and two other local GPs. Representing ICHP's

academic partner organizations were the Principal of the Faculty of Medicine at Imperial College London, the Head of Operations at the local CLAHRC and the acting Chairman/Director at ICHP.

Moderators Five moderators representing a wide range of health service expertise took part; see Appendix 2. One moderator produced the media during the simulation (see Supplementary Materials 4). The remaining moderators had three roles. First, they acted as consultants during the simulation to ensure the simulation's realism. Second, they acted in ad hoc roles during the simulation when participants wished to speak with an official not already represented, e.g., a Secretary of State or a local authority official. Third, they alerted the facilitators if any difficulties emerged during the simulation.

Facilitators The simulation was led by the current article's author, GP, who has vast experience running similar events. GP was assisted by seven other trained facilitators (see Appendix 2).

Simulation schedule

Lateral Play took place across three sessions as described below.

Session 1—Introduction Session 1 was a 2-h briefing to introduce participants to Greendale, their groups and their roles. The information available to each participant reflected their role. Participants were given and expected to read their information prior to Session 2.

Session 2—Main event Session 2 took place 8 days after Session 1 and lasted from 09:30 to 17:00. Each hour represented 28 days in Greendale time. The simulation started with the first of three Greendale Partnership board meetings. Each board meeting was followed by a group meeting. The Chief Executives of each organization attended the board meetings to provide updates on their group's progress, while other participants observed. Session 2 closed with a 30-min review of the day.

Session 3—Reflection Session 3 took place 14 days after Session 2. This was a 4-h session that allowed participants to reflect on their experiences and how they might apply what they had learned in the simulation to the development of ICHP, i.e., double-loop learning. Session 3 was split into three parts, during which participants discussed why the partnerships existed, identified issues called key themes and discussed how ICHP could address the issues described by each key theme.

Evaluation tools

The outcomes of Lateral Play were measured via participants' self-reports and via researchers' observations of participants' interactions.

Self-report

Participants were asked to complete three online questionnaires (see Supplementary Materials 3). To evaluate participants' reactions and learning, the "Reaction and Learning Questionnaire" was sent out 14 days after the simulation ended. The Reaction and Learning Questionnaire included 14 items that participants responded to using Likert scales followed by three items requesting their free-text responses, (1) "What do you think are the benefits of using this type of simulation?" (2) "Has the Lateral Play simulation made you more aware of your collaboration and cooperation needs within ICHP?" (3) "If so, how?"

To evaluate the participants' behaviors and ICHP's results pre- and post-simulation, two "Behaviours and Results Questionnaires" were sent out. The first was sent 10 days before the simulation and the second was sent 1 year after the simulation ended. Changes in the likelihood of participants' behaviors were assessed using the Behaviour Change Wheel's components, including: capability, opportunity and motivation. Participants were first given definitions for each component and then asked to rate their behavior for each using Likert scales. Changes in ICHP's results were assessed using one item for each of ICHP's seven interim objectives (aligned with AHSN's objectives as described in the introduction) via Likert scales. In the second Behaviours and Results Questionnaire, participants were, in addition to the above, asked to provide free-text responses to the following question: "Thinking back to the Lateral Play simulation, do you think that the simulation had a positive, negative or a neutral impact on the development and progression of the partnership?"

Observations

During Sessions 2 and 3, the facilitators took observational notes, and participants used flipcharts during their meetings. These data were collated, reviewed and recorded at the end of the Sessions.

Results

The results section first reviews participants' self-reported data and then the researchers' observational data.

Self-report

Participants' self-reported data are described for the Reaction and Learning Questionnaire and then the Behaviours and Results Questionnaire.

Reaction

Sixteen participants completed the Reaction and Learning Questionnaire. The results are in Table 1. Participants reactions were generally positive (range 3.8–4.3 out of 5.0). Participants gave the simulation's organization and relevance high marks (4.3 and 4.1). For example, one participant said that "*The material was relevant, topical and realistic, and the organisation and facilitation was very good indeed*." Participants found the least satisfactory aspect of the simulation to be the realism of its content (3.8).

In the free-text responses, nine participants mentioned concepts related to teamwork, relationship-building and networking. For example, one participant said that "*This type of simulation provides an excellent opportunity for leaders in different organisations to work together.*" Participants also indicated that Lateral Play promoted organizational problem solving by providing an environment "*… to test out actions and potential responses in a safe and constructive way.*" Participants felt an increased awareness of sector issues, with one participant reporting that "[Lateral Play] *builds a system wide perspective and some sense of responsibility for the regional system not just my organisation.*" Lastly, participants believed that Lateral Play helped them learn about others' positions, with one participant saying that "[It was] *very informative to see how other participants work* [and] *understand their perspectives…*"

Learning Participants felt that their understanding of ICHP's objectives of (3.9) and of the issues facing ICHP (4.3) were enhanced by Lateral Play. For example, one participant said that "*Lateral Play made me more aware of the ways in which* [collaboration] *must be achieved, and the potential barriers to achieving it*." Participants noted that cooperation with primary care was a significant barrier, with one participant saying that "*We identified major challenges in trying to* "*on board*" *primary care providers given their independent and federated structures*." Whereas most of the comments were supportive of collaboration, one trust Chief Executive was more guarded saying that "[We] *need to be so careful about what hands* [we] *play and how we play them.*"

Behavior Eighteen participants completed the first Behaviours and Results Questionnaire and ten completed the second. The results are in Table 2. Participants believed that their capability moderately increased ($p = 0.02$, *Cohen's* $r = -0.44$) but not their opportunity or motivation.

Table 1 Participant feedback from Lateral Play

	Mean	Standard deviation
Reactions		
Participation and content		
Scale: 1-strongly disagree to 5-strongly agree		
The simulation was well organized	4.3	0.6
I understood the aims and objectives of the simulation	4.0	0.6
I was appropriately challenged by the material	3.8	0.6
I found the course content to be realistic	3.6	0.7
I found the course content to be relevant	4.1	0.9
I was actively involved in the simulation	4.3	0.6
Educational benefit		
I found this method of learning to be useful	4.1	0.8
Learning		
Future actions around ICHP		
I better understand the objectives of ICHP	3.9	0.7
I am more aware of my current/future roles and responsibilities within ICHP	3.9	0.7
I am more aware of the issues facing ICHP	4.3	1.1
I am better able to address important issues facing ICHP	3.9	0.8
Employer relationship with Partnership		
Scale: 1-unimportant to 5-very important		
How important are the needs of the partnership in your work?	4.1	0.9
How important are the needs of your trust/organization in comparison to the needs of the partnership?	4.4	0.7

Table 2 Changes in perceived participants' behavior and the organization's results pre- and post-simulation

	Pre-simulation mean	Post-simulation mean	Wilcoxon signed-rank test		
			Z-score*	P value**	R value**
Behavior					
Capability	4.68	5.23	−2.366	0.018	−0.439
Opportunity	4.78	4.97	−1.270	0.204	−0.282
Motivation	5.58	5.63	−0.314	0.753	−0.376
Results					
Performance	3.42	3.60	−1.352	0.176	−0.251

*Here the Z-score indicates the number of standard deviations from the mean a datum is

**Here the *P* value indicates the degree to which numbers in different sets differ in extremity. Lower values indicate a greater likelihood that the numbers in each set statistically differ

***Here the R value indicates the strength of the relationship between two sets of numbers. Higher values indicate a stronger relationship between the numbers in each set

Results The overall performance of ICHP was not deemed to be significantly different in the year following the simulation. Seven participants provided free-text feedback on Lateral Play's effects. One participant felt that Lateral Play had a neutral impact on the partnership. Two participants felt that Lateral Play had not had any positive impact; for example, one participant said that "[Lateral Play] *has had no impact that I have seen*" and "*I am not sure it has had any impact on the degree of collaboration*." The remaining participants felt that Lateral Play had a positive impact, for example, one participant said that "[Lateral Play] *had a positive impact, particularly in terms of relationship building and breaking down some of the apparent organisational silos*."

Observational data

The observational results section starts at Session 2's second board meeting. Session 1 was only used to introduce participants to the simulation, i.e., single-loop learning about the simulation's layout, their group's issue and their role. Session 2's first board meeting welcomed participants to the simulation's main event. The observational data from that point forward evidence an evolution of participants' double-loop learning.

Session 2: Second board meeting During the second board meeting, each group summarized the progress they had made on their issue that morning. Each group's progress is briefly described below.

Group 1: Orthopedic services Group 1's unanimous decision was to transfer services from Chrysalis and Essen to other sites. Group 1 engaged at length with these two trusts, but the trusts were not in agreement with Group 1's decision and threatened to make the discussions public. The CORE commented that Group 1 had not adequately considered the research or education implications of their decisions. Group 1 considered utilizing a consultancy to appraise the options but were wary of the cost and instead proposed that they liaise with other groups to see how their recommendation affected other services. More time was requested to explore virtual ward solutions with Group 3 and develop a proposal for split elective and emergency services across Greendale.

Group 2: Maternity service Group 2 proposed creating a single provider-run consultant hub with an attached midwife-led unit and two further midwife-led units at Davenport and Essen. The location of the hub could be either Appleton, which has a strong research and academic base, or Blackstone, which is a Foundation Trust. Chrysalis maternity unit would close. The group also proposed developing a private maternity service to increase income. The new model was agreed as a joint venture between all existing units who would share the financial risks and benefits. The CCGs were supportive. However, Group 2 conceded that that they had not discussed the proposals with any patients and acknowledged negative local media coverage that described a pregnant patient dying after being transferred from Chrysalis's maternity unit.

Group 3: Virtual ward Group 3 advised the Greendale Partnership that if they were to develop the virtual ward concept they should do so in-house rather than with Mountain Health. They cautioned that they were unsure whether the virtual ward concept would be worthwhile. Closing ward beds reflected poorly in the media so could adversely affect the public's acceptance of the Greendale Partnership. If the virtual ward project moved forward, communication and integration with primary care were deemed essential. Arguments were

also put forward in favor of the virtual ward's potential longer-term benefits, if developed within the accountable care model of Group 4.

Group 4: Accountable care model Group 4 discussed the need for a pilot that would start with a specific group of high-risk patients to improve outcomes and decrease care costs. They felt that the pilot should be led by the Greendale Partnership rather than an individual institution, because the accountable care model would require an innovative delivery with integrated information systems and commissioned support. Group 4 also discussed exploring the concept of virtual wards with Group 3 to bring research and educational opportunities to the Greendale Partnership.

Group 5: Community and mental health services Group 5 proposed a merger of the Frontier and Gateway Trusts to create a combined mental and community healthcare provider. The merger would offer a platform for a longer-term integrated care organization to interface between health and social care and comply with the proposed single tariff arrangements. The new organization could be a hub for the accountable care model developed by Group 4.

Session 2 evening Following the group presentations, there was a consensus among the Greendale Partnership's board members that collaboration between groups could enhance progress. Indeed, the following group meetings were more collaborative. Participants' interactions during these meetings are summarized below in two sections. The first section describes developing acute care (Groups 1 and 2) and the second section describes creating an accountable care organization (Groups 3, 4 and 5).

Developing acute care The Greendale Partnership board recommended that Groups 1 and 2 merge to collaboratively develop proposals for acute care. The first proposal was to pick specific programs and engage where needed, e.g., orthopedics and maternity services. The second proposal was a more radical "holistic system" involving a shared investment-disinvestment strategy wherein recommendations for acute and elective care would be made using an evidence-based approach with novel pathways, structures and delivery programs. The CCGs were supportive of this plan, but the public was not, and the media cited poor communication between partner organizations.

Creating an 'accountable care organization' Groups 3, 4 and 5 merged to discuss the formation of an accountable care organization to provide an effective integrated care process, using pooled budgets between health and social care. Given the importance of primary care, a newly formed body of general practitioners, called the "Greendale Medical Associates," would oversee the development and running of the organization. The groups remained committed to the merger of Frontier and Gateway Trusts but were cautious about the benefits of virtual wards.

Session 2. Review At the end of Session 2, moderators commented. Some moderators praised the participants' teamwork and thorough cost benefit analyses. Other moderators cautioned participants to communicate more effectively with the public and local authorities. Some moderators expressed concern regarding whether the decisions made by the Greendale Partnership had any legitimacy within or outside the partner organizations and noted that this was a problem ICHP needed to overcome.

Session 3 In Session 3, participants discussed why ICHP existed, identified key themes and discussed how ICHP could strengthen and improve the issues described by each key theme. Each discussion is further described below.

Why does ICHP exist? Participants agreed that ICHP currently lacked a sense of purpose. Six streams were suggested to more fully develop that purpose. First, ICHP needed to articulate each partner's values and objectives in the spirt of collaboration. Second, ICHP needed to develop a vision that summarized its own values and objectives. Third, a map showing healthcare variation among ICHP partners needed to be developed highlighting each organization's strengths and weaknesses. Fourth, the clinicians within ICHP needed to become actively engaged. Fifth, ICHP's partners needed to focus on opportunities for collaboration to achieve AHSN status. Sixth, ICHP needed to lead a potential quick-win project that involved both primary and secondary care.

Key themes Five key themes were identified. The final discussion focused on the ways partner organizations could collaborate to improve healthcare. A summary of each key theme and how ICHP would act to improve it are described below.

The first key theme had to do with primary care organizations. Notably, the representation of primary care in the simulation reflected a real-life issue where primary care representatives cannot act with executive authority. As participants believed the success of ICHP would depend on engagement with primary care, they wanted primary care to develop a stronger evidence base regarding quality and cost. To do this participants agreed that ICHP should provide an opportunity to engage with primary care for research, e.g., in large-scale patient recruitment for clinical trials.

The second key theme had to do with creating a level playing field among partner organizations. Participants thought that ICHP's initiatives should be equitable and all partner organizations should see some reward within 3 years.

To do this participants agreed that there needed to be greater transparency and less competition. ICHP's board could promote this process by providing clarity on the research and educational opportunities available to all partners.

The third key theme had to do with public and local government engagement. The involvement of politicians was poor in Greendale, and participants agreed that ICHP should work to more positively engage politicians. To do this, participants agreed that the current Engage with Health and Wellbeing Boards should be used to promote public and local government engagement.

The fourth key theme had to do with creating a quick and positive project for ICHP. The participants expressed a desire to focus on a short-term achievable project to generate a "feel-good" factor rather than reconfiguration projects that may lead to winners and losers. To do this, participants agreed that the agenda of ICHP must be clear and that each partner organization should recognize opportunities to collaborate while moving forward.

The fifth key theme had to do with ensuring ICHP had value and legitimacy. Participants questioned whether ICHP had the value or the legitimacy to act. Participants thought that an initial quick-win project that focused on the challenges between primary and secondary care could help improve relations between ICHP's partners to strengthen ICHP's value and legitimacy. ICHP also could play a role in bringing together local authorities and CCGs. To further promote ICHP's value and legitimacy, participants agreed that ICHP needed a campaign on local excellence, relevant across all sectors, e.g., a campaign promoting patient safety, at which their University links could be promoted and used to create opportunities for research and education.

Post simulation In the months following Lateral Play, ICHP developed a working program that was heavily influenced by the discussions which took place during and after Lateral Play. An outline of the working program is provided in Table 3. The full plan, detailing project aims and objectives, is presented in Supplementary Materials 5.

Conclusions

Behavioral simulations can facilitate double-loop learning to enhance collaboration and shared decision-making among newly formed partner organizations. Participants' feedback indicated that Lateral Play generated innovative ideas and improved relationships between ICHP's partner organizations.

During the simulation there was a clear progression towards collaboration. After the second board meeting, participants reorganized the whole agenda of the simulation. This move towards collaboration was sometimes self-motivated (Groups 3, 4 and 5) and at other times prompted by the board (Groups 1 and 2). The discussions at the end of Session 2 focused on how the needs of individual partner organizations could be balanced against the needs of the whole partnership.

Participants acknowledged that failure to innovate can be economically damaging and ultimately result in lower care quality (Fish 2013). In this spirit collaborative agreements were made in Lateral Play, but no final decisions were taken to remove or alter services from individual partner organizations. Such situations will be encountered by ICHP in real life, and likely such decisions will need to be made. Indeed, while participants experienced some negative consequences in the simulation, their real-life decisions may prove more challenging (Joint Committee of Primary Care Trusts 2013).

During the simulation the public had a significant impact on events through the media. For example, the negative reporting of the Mountain Health virtual ward proposal led the group to reconsider their plans. In contrast, the negative media coverage on maternity closures was met with little reaction. With better public and political engagement, the debate may have been more reasoned.

Table 3 ICHP's Working Program (developed following Lateral Play)

ICHP strategic objectives	Projects
Enable the discovery of best practice	Alignment and dissemination of research
	Intelligent use of data
	Mental health
Adopt best practice systematically	Patient safety
	Evaluation of whole systems integration
	Chronic obstructive pulmonary disease
	Cardiovascular rehabilitation
	Cancer
	Neuro-rehabilitation
Support wealth creation in the sector and beyond	Overseas development
	Collaboration with industry

The knowledge gained from Lateral Play, such as the importance of local authority and public involvement, should serve ICHP well. Furthermore, the recognition that each partner organization has differing strengths and objectives should enable partners to work together more openly in the development of healthcare delivery, research and education, such that redevelopment is presented as a positive opportunity.

Interaction and commitment to action from primary care was a further challenge that emerged. While the CCGs contained representatives from primary care, these representatives did not have the power to act on behalf of GPs in the way that the trust representatives did. Indeed, the quality and infrastructure of primary care as a whole came under consistent scrutiny by participants. This created difficulties in commissioner and provider planning. A recent independent report suggests that CCGs and AHSNs have a significant role to play in encouraging innovation within primary care (Stokes et al. 2014). Lateral Play did not directly address this issue or provide potential solutions, but there is the opportunity for a future simulation to do so.

There are at least two limitations to note. First, the response rate to the surveys was low, which may have produced biased results. While further reminder emails may have increased participation, participants' seniority rendered this inappropriate. Second, the participants felt the game lacked realism. However, whether the simulation's realism adversely affected Lateral Play's effectiveness is unknown. Regardless, Lateral Play undoubtedly helped to encourage collaboration and the awareness of differing perspectives between individuals and organizations. This will help ICHP avoid unintended consequences as have occurred in previous healthcare policy changes (Gaynor et al. 2012).

Participants did not believe the simulation improved ICHP's performance. Prima facie, this suggests that ICHP has made little progress since the event; however, ICHP's real-world progress suggests otherwise. Notably, ICHP was designated to be one of the first AHSNs in the United Kingdom, and this suggests that positive progress has been made plausibly influenced by Lateral Play.

Acknowledgements The research was commissioned by Imperial College Health Partners and run by the Centre for Health Policy, Institute of Global Health Innovation and Imperial College London.

The current article presents independent research commissioned by the National Institute for Health Research (NIHR) under the Collaborations for Leadership in Applied Health Research and Care (CLAHRC) programme West Midlands. The views expressed in this publication are those of the author(s) and not necessarily those of the NHS, the NIHR or the Department of Health. The current authors express their appreciation for Alasdair Liddell who helped design Lateral Play, and for Pendaran Roberts whose editorial comments increased the current article's readability.

Compliance with ethical standards

Conflict of interest The authors declare that they have no conflict of interest.

Appendix 1

Greendale University is situated in the center of the urban area. It has a population of 150,000 students and forms an Academic Health Sciences Centre with Appleton Trust. In addition to the organizations described below, there are Provident (private hospital) and Howston (an NHS Foundation Trust) outside the partnership providing community-based services to North Greendale CCG.

(1) Appleton is the largest trust in the partnership and is linked to the medical school. Although not a Foundation Trust, it does form an AHSC with Greendale University. Appleton is within the North Greendale CCG catchment; it employs almost 5000 staff and has over 400,000 patient episodes per annum. The buildings and facilities at Appleton are relatively new and the trust performs well

Table 4 Activity and demographic data for each Greendale Trust

Organization	Appleton	Blackstone	Chrysalis	Davenport	Essen	Frontier	Gateway	Greendale total
Total activity (per annum)	402,082	421,649	251,897	299,185	258,896	39,336	418,645	2,091,720
Outpatient activity (p/a)	314,277	332,199	190,553	236,291	193,374	35,019	415,700	1,717,412
Day case activity (p/a)	20,605	27,953	20,598	25,923	18,090	243		113,412
Inpatient activity (p/a)	87,805	89,451	61,344	62,893	65,523	4347	2945	374,308
Bed capacity	750	550	300	400	400	94	601	3145
Bed occupancy (%)	84	88	92	78	93	82	91	87
Staff	4729	3838	2011	2249	3709	2576	3153	22,265
Spend (£million p/a)	328	214	123	132	243	104	154	1299
Net surplus (deficit)	(£5.4 m)	£3.9 m	(£5.3 m)	(£5.8 m)	(£8.3 m)	(£3.1 m)	(£8.4 m)	

in quality and service indicators. However, it has a poor financial position.

(2) Blackstone is a Foundation Trust. It is a large district general hospital and is a busy, modern Acute Trust working with both CCGs. Blackstone has almost 4000 staff and 550 beds. It has excellent transport links and profitable orthopedic and maternity services, but poor quality indicators and limited academic activity.

(3) Chrysalis is an Acute and Community Trust with a private finance initiative commitment, and it is not a Foundation Trust. It has recently invested in new facilities and buildings and is sited close to a new business district within the area. Chrysalis employs just over 2000 staff and handles over 250,000 patients episodes per annum.

(4) Davenport is an Acute Trust but not a Foundation Trust. It is a similar size of hospital to Chrysalis and Essen. Davenport is sited in the middle of the North Greendale CCG catchment—but outside of the main urban center. Davenport has almost 300,000 patient episodes per annum, 400 patient beds and just more than 2200 staff.

(5) Essen is an Acute Foundation Trust. It is a busy, high performing trust and works closely with other organizations outside the partnership given its location on the southern boundary of the catchment. Essen has annual activity levels of approximately 250,000 patient episodes, employs almost 4000 staff and has 400 patient beds.

(6) Frontier is a large Community Trust covering the South Greendale catchment. It is not a Foundation Trust, and discussions on an applicable Foundation Trust pathway have been constrained by a deficit budget and limited evidence of growth. As a Community Trust, Frontier does not offer mental health services, but has a focus on low-risk case activity and outpatients, with inpatient episodes accounting for only 10% of activity.

(7) Gateway is the only Mental Health Trust in the partnership. It has yet to reach Foundation Trust status. Gateway has over 600 patient beds and almost 3000 staff. It does not have any community-based services, but is a national pioneer in online cognitive behavioral therapy. The CCGs across Greendale Partnership have agreed to adopt new integrated tariff arrangements covering community and mental health services. This will have an impact on Gateway's finances and may threaten the current Foundation Trust pathway.

Appendix 2

Moderators

(SA) Adam, Sheila Adam—Previous Deputy Chief Medical Officer, NHS.

(JA) Appleby, John—Professor, Chief Economist, The King's Fund.

(PC) Corrigan, Paul—Professor, CBE, Previous special advisor on health to the Prime Minister and to the Secretary of State for Health.

(SD) Dorrell, Stephen—Rt. Hon., MP, Chairman of Health Select Committee and Previous Secretary of State for Health.

(NT) Timmins, Nick—Professor, Senior Fellow, The King's Fund and former Public Policy Editor, Financial Times

Facilitators

(DC) Anonymous.

(RD) Anonymous.

(SG) Goss, Sue—Local Government expert.

(AH) Dr Axel Heitmueller-Managing Director, ICHP.

(GP) Greg Parston-Executive Director, Centre for Health Policy.

(DR) Ramirez, Daniel—Researcher, Centre for Health Policy.

(FR) Anonymous.

(IV) Ivo Vlaev-Professor, University of Warwick.

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